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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,955	02/26/2002	Jason Barnabas Langhorn	CTS-2287	5009
29184	7590	09/09/2004	EXAMINER	
CTS CORPORATION 905 W. BLVD. N ELKHART, IN 46514			GEBREMARIAM, SAMUEL A	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/082,955

Applicant(s)

LANGHORN, JASON BARNABAS

Examiner

Samuel A Gebremariam

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/1/04.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hinds EP, 1057779A2 in view of Kainuma et al. U.S. patent No. 6,483,190.

Regarding claim 1, Hinds teaches (figs. 1, 2 and 3) a semiconductor package comprising: a planar low temperature co-fired ceramic substrate having a first (22) and second layer (30) mounted adjacent each other the first layer having a first surface (24) and the second layer having a second surface (23) a micro-machined semiconductor device (40) located adjacent the first surface (24), the micro-machined semiconductor device having a plurality of first pads (37) and an active central area (42), a plurality of ball pads (17) located on the second surface, a plurality of second pads (44) located on the first surface a plurality of vias (25 and 33) extending through the substrate between the first and second surfaces the vias (33) connected to the ball pads (17) and to the first pads (37) a reflowed solder joint (50, col. 4, lines 50-59) located between the first (37) and second pads (44) for electrically connecting the substrate to the semiconductor device the reflowed solder joint formed from a first reflowed solder paste (col. 4, lines 50-57) a solder seal ring (36), located between the micro-machined semiconductor

device and the first surface around an outer perimeter (fig. 2 and 3) of the substrate for making a hermetic seal between the micro-machined semiconductor device and the substrate (col. 7, lines 45-48) and plurality of solder spheres mounted to the ball pads by a second reflowed solder paste.

Hinds does not explicitly teach a wire bond bump located between the micro-machined semiconductor device and the first surface for supporting the micro-machined semiconductor device during assembly.

However Hinds shows in figures 2 and 3 a structure preventing the micro-machined semiconductor device from contacting the first surface (24). Furthermore the use of wire bump structures is conventional in the art and also taught by Kainuma (fig. 2b) for protecting a silicon chip (101) using bump structures (113 and 114).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bump structures taught by Kainuma in the structure of Hinds in order to protect the micro-machined semiconductor device.

The limitation of ultrasonically deposited wire bonds is considered a product-by-process claim. "[E]ven though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Furthermore the limitation the wire bond bumps preventing the micro-machined semiconductor device from contacting the top surface during solder reflow is not given patentable weight because, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Regarding claim 26, Hinds teaches (figs. 2 and 3) substantially the entire claimed structure of claim 25 above including a plurality of circuit lines (26) located on the first surface (24), the circuit lines connected between vias (20 and 25) and the second pads (44).

Regarding claim 27, Hinds teaches substantially the entire claimed structure of claim 25 above including the substrate does not have a cavity. Since the combined structure of Hinds and Kainuma are the same as the claimed structure, the substrates of the combined structure does not have cavity.

Regarding claim 28, Hinds teaches substantially the entire claimed structure of claim 25 above including wire bond bumps that are formed of gold alloy (Kainuma (col. 5, lines 19-52)).

Response to Arguments

3. Applicant's arguments filed 7/1/04 have been fully considered but they are not persuasive. Applicant argues that the neither nor Kainuma disclose or suggest a semiconductor package that includes a first reflowed solder paste for making an electrical connection between a substrate and a semiconductor device and a wire bond bump located between the micro-machined semiconductor device and the substrate to support the micro-machined semiconductor device during solder reflow. Applicant also argues the combination of Hinds and Kainuma teaches away from the present invention because the combination produces a cavity. As stated in the rejection above the combined structure of Hinds and Kainuma teach the claimed invention. Furthermore the combined structure of Hinds and Kainuma would not introduce a cavity or gap other than the existing gap that is indicated by region (35) in Hinds structure i.e the same kind of gap as the present invention.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of


the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A Gebremariam whose telephone number is (571)-272-1653. The examiner can normally be reached on 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SAG
September 2, 2004



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